sions, is more than of academic interest and cannot be overemphasized. The disease, even in its advanced form, is curable with appropriate antituberculous medications, but the success of therapy improves when it is instituted early.[16] In a patient in whom tuberculosis is even considered in the differential diagnosis, it is imperative that cultures be adequately done to rule out this diagnostic possibility. Any biopsy specimens obtained in such patients (transbronchial, peritoneal, bone marrow) should be sent to a microbiology laboratory with specific instructions to culture for *M tuberculosis*.

At the time of exploratory laparotomy, a large biopsy specimen failed to show histologic evidence of tumor. While this finding could certainly represent sampling error or a dramatic response to the intraperitoneal chemotherapy, gastric cancer is only modestly sensitive to the currently available agents and complete remissions are extremely rare.[19] In addition, even in patients responding to therapy, an 18-plus month survival from the time of diagnosis of an extensive intra-abdominal metastatic tumor with no current evidence of active disease is very unusual.

Two retrospective analyses of patients with lung cancer undergoing surgical resection showed improved survival for those patients in whom a postoperative empyema developed.[20,21] It was speculated that the nonspecific immune response induced by the infection resulted in tumor cell kill and an increased survival rate. In a rat transplantable tumor model, it has been found that the intrapleural injection of bacille Calmette Guérin (BCG) vaccine can suppress tumor growth.[22] Similarly, while the benefit of intrapleural administration of BCG following curative surgical treatment of lung cancer remains controversial,[23] one group has shown a small but statistically significant improvement in survival for patients with stage I non-small cell lung cancer receiving intrapleural BCG plus isoniazid compared with a control group receiving only isoniazid.[24,25] No benefit could be shown for patients with stage II or III lung cancer in this study. It is interesting to speculate that the intensive inflammatory response elicited by the *Mycobacterium* infection shown at the operation may have resulted in significant tumor cell kill and be responsible for the patient's remarkable clinical course.

In summary, this case emphasizes the similar clinical and laboratory features of peritoneal carcinomatosis and tuberculous peritonitis. A high index of suspicion for the latter disease was finally responsible for the correct diagnosis being made and appropriate therapy being instituted. In addition, this case underscores the importance of strongly considering in the differential diagnosis of a complex case treatable diseases, especially when the alternative explanations have limited therapeutic implications.

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Granuloma Inguinale in a White Teenager—A Diagnosis Easily Forgotten, Poorly Pursued

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THE CONDITION variously known as granuloma inguinale, donovanosis or granuloma venereum is an uncommon disease process producing genital ulcerations that can be quite locally destructive and are known for their chronicity. The disease is most commonly seen in the southeastern United States. Although it is mandatory that this venereal disease be reported to the health department, many physicians are unaware of this fact, which may lead to underreporting. It is a relatively rare disease in California (Table 1). Granuloma inguinale can be easily diagnosed, although sometimes it is overlooked in differential diagnosis because of its rarity. The purpose of this report is to present a case of granuloma inguinale occurring in a white teenaged girl from California who suffered from a

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TABLE 1.—*Reported Cases of Granuloma Inguinale, 1977-1982**

Area	1977	1978	1979	1980	1981	1982
United States	75	72	76	51	66	17
Region 9 (Ariz, Calif, Hawaii, Nev)	4	2	1	2	4	5
California	4	2	1	2	4	4
Atlanta	36	41	47	25	4	0

*Source Form CDC 73.688, p 20, Centers for Disease Control, Atlanta. (Provided courtesy of Perry Brown, Director of Public Health, Epidemiology Analyst, Department of Health Services, County of Los Angeles.)

chronic ulcerative vulvar lesion for several months before the condition was diagnosed as granuloma inguinale. We also review the clinical manifestations, diagnostic techniques and therapeutic regimens related to granuloma inguinale.

Report of a Case

The patient, an 18-year-old nulligravida woman, presented to the University of California, Los Angeles (UCLA), with a ten-month history of painful vulvar ulceration. She had been sexually active for two years. The first sexual partner had been a "casual contact" some weeks before she had begun a steady relationship with her current sexual partner of 11 months' duration. The first partner had traveled to New Orleans before their sexual contact.

The patient had an ulcer that started as a very sore, small spot in the left vulvar area beginning ten months before the examination. She noted dysuria, increased vaginal discharge and local itching and went to see the first of eight physicians. Specimens from the patient were cultured for gonorrhea, herpes and routine culture and sensitivity several times over the subsequent ten months. These tests, including five separate serologic tests for syphilis (VDRL), were negative. During this ten-month period the patient took courses of antibiotics, usually for only a week, including ampicillin, doxycycline hyclate (Vibra-Tabs), erythromycin and cephalexin (Keflex). A course of amoxicillin and cefaclor (Ceclor) was also taken. After some of these therapies there was a waning of the ulcerative lesion; the ulcer returned persistently, however. The patient's current sexual partner was examined by a physician and was told that he had no lesions or disease. Despite the vulvar ulceration, the patient would intermittently have coitus when the ulcer was "almost healed." After sexual activity the ulcer would at times exacerbate, and the patient's physician felt that this activity was causing local trauma leading to the problem. When the patient came to the UCLA Vulvovaginitis Clinic, she had not been taking antibiotics for three weeks. The ulceration was being treated by local measures such as sitz baths and was becoming increasingly painful.

On physical examination, including vital signs, the following abnormalities were found. A mildly tender left inguinal adenopathy was noted. There was a 2 by 2.5 cm, exquisitely tender, soft ulceration involving the left labium majus and perineal body (Figure 1). The ulceration had a well-defined border and appeared to have superficial infection and local induration with hypertrophic granulation tissue at the edges. There were no lesions on bimanual examination and inspection of the cervix, vagina and rectum.

Laboratory tests (UCLA Clinical Laboratories) disclosed the following values: A leukocyte count of 10,600 per μl, a differential of 65% segmented forms, 6% band cells, 4% eosinophils, 1% basophils, 18% lymphocytes and 6% monocytes; hematocrit was 43.1%. Urine culture and sensitivity were negative. Tissue specimen cultures were negative for *Hemophilus ducreyi*,[1] *Neisseria gonorrhoeae* and herpes virus[2]; culture of the ulcer bed was positive for penicillin-resistant *Staphylococcus aureus*; VDRL was negative. A wet mount of a specimen from the lesion for dark-field examination was negative for *Treponema pallidum*. A "touch preparation" of the ulcer was *positive by Giemsa stain for Donovan bodies* (Figure 2). A vulvar biopsy specimen showed chronic and acute ulceration without evidence of viral cytopathic effect.

Because of an allergy to tetracycline, the patient was treated with chloramphenicol, 50 mg per kg per day, divided in four doses every six hours. After seven days of this treatment, the ulcer responded by a 30% decrease in size, less induration and pain and evidence of healing by reepithelialization with no secondary infection. Antibiotic therapy was continued and the patient was monitored frequently. After 23 days of a regimen of oral antibiotics, the ulcer had completely reepithelialized, but there was moderate residual scarring (Figure 3).

Following this ordeal the patient requested and was referred for psychological therapy with regard to her future sexuality. It was noted that she was showing substantial depression and had negative feelings concerning future sexual relationships and sexual functioning after this chronic illness.

Discussion

The first case of granuloma inguinale was reported in the United States in 1913,[3] although the earliest description of the disease came from India in 1882.[4] In the early 1900s, Don-

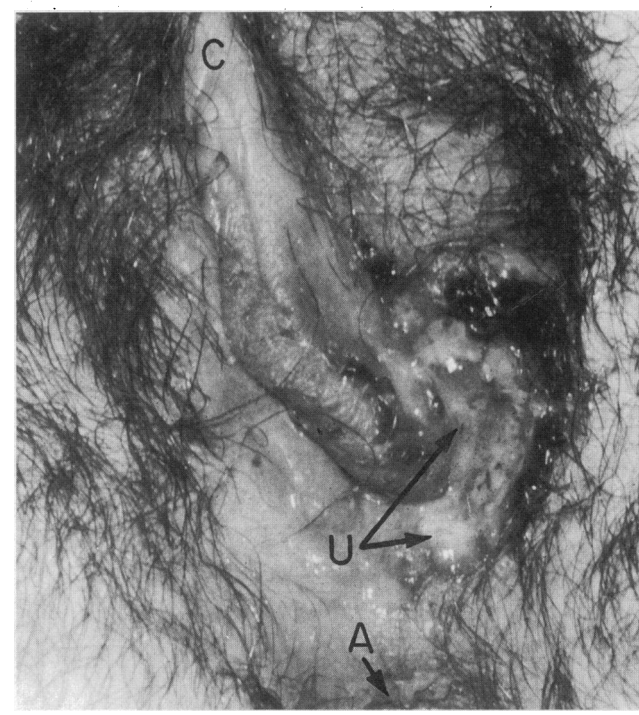

Figure 1.—This tender ulcer with a serpiginous edge and surrounding induration was photographed during the patient's first visit. **A** = anus, **C** = clitoris, **U** = ulcer of granuloma inguinale

ovan described the agents that he suspected caused this disease, referring to them as "epithelial cell parasites" due to intracellular protozoa,[5] thus the term donovanosis, which today is used preferentially as the identifying nomenclature in some articles. The term "granuloma inguinale" is attributed to Crocker in his treatise on tropical diseases of the skin.[6] The bacterial cause of this disease was not established until the early 1940s. Even today Koch's postulates have not been satisfied in determining the precise cause or mechanism of the disease process.[7]

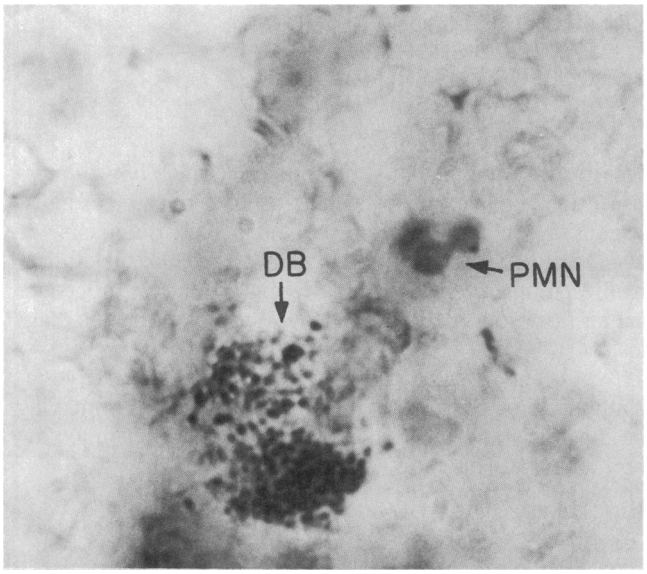

Figure 2.—Oil-immersion microscopy of the touch preparation of the ulceration, Wright's-Giemsa preparation, showed numerous histiocytes laden with Donovan bodies, an example shown here **(DB)** next to a polymorphonuclear leukocyte **(PMN)** (reduced from magnification ×2,500).

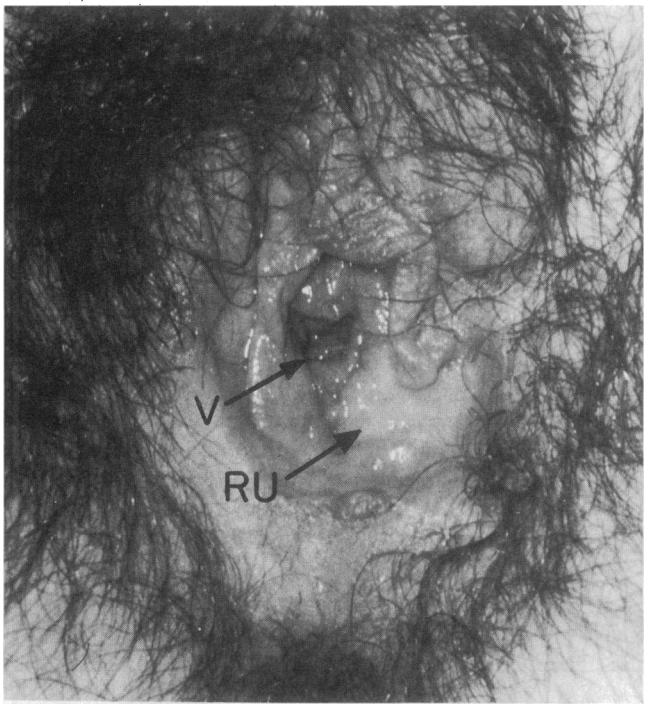

Figure 3.—Reepithelialization of the ulcer was evident four weeks after initiation of antibiotic therapy. **RU** = reepithelialized ulcer, **V** = vagina

Calymmatobacterium granulomatis, the Donovan bodies and presumed causative agents, was first cultured in the yolk sac of chick embryonated eggs,[8] defining a bacteriologic cause for granuloma inguinale. The yolk sac remains the most reliable culture mechanism. Although not available for clinical use because of the difficulty of cultivation, adaptation of yolk sac preparations to semisynthetic media has been successful,[9] with best growth in an anaerobic to microaerophilic environment. This bacterium has been studied ultrastructurally with electron microscopy[10] and is now classified as a nonmotile, encapsulated, pleomorphic, Gram-negative bacillus. Although sexual contact has been postulated as the most common method of acquiring the disease, it has occurred in people who are not sexually active. Transmission is unpredictable because there is a low incidence of infectivity in sexual partners of infected patients,[11] as cited in our case report. The disease is more common in the southeastern United States, in underdeveloped countries, in dark-skinned populations and in men.[12]

The incubation period varies from days to months.[13] The initial lesion, a papule, breaks down and becomes a beefy-red, granulomatous ulcer after a varying length of time. Unless secondary infection occurs, the ulcers are minimally painful; secondary infection increases pain greatly, however. The chronicity of the disease is its hallmark. In women, lesions are found most commonly in the labial or perineal areas. Vaginal and cervical lesions associated with abnormal genital bleeding have been reported.[14] A vesicovaginal fistula may also occur. In men, severe disease may erode and destroy the penis. In affected homosexual men, there is a high percentage of perianal involvement.[10] Secondary infection is common in lesions of women. Ulcerations are superficial with an irregular serpiginous edge and surrounding induration and have central hypertrophic granulation tissue. Dissemination of these lesions and death have been reported, but rarely.

Because tissue culturing techniques are not generally available, the diagnosis of granuloma inguinale is usually made using standard techniques that are more readily available throughout the United States.[15] The touch preparation technique involves either touching a glass slide to the granulation tissue of the lesion or preferably obtaining a small piece of tissue through biopsy and crushing the tissue between slides, then processing the slides either with Giemsa, Wright's or Leishman's stains. This permits identification of histiocytes laden with intracytoplasmic organisms (Donovan bodies). If the patient has been treated for a significant amount of time before, it may be necessary to repeat the process more than once to identify the agent. The organisms cease to exist in the lesion bed, at least by the above techniques, after a patient has had 5 to 14 days of tetracycline therapy.[10] Although serologic testing for this particular disease has been reported, it is not now clinically used.[12]

A longer-than-usual course of antibiotics is necessary to cure the disease compared with other typical venereal disease conditions. As seen in this case, despite several therapeutic regimens that included drugs stated to be effective against the disease, short courses of treatment may be ineffective. Tetracycline,[16] co-trimoxazole[17] and chloramphenicol[18] are effective against this disease. Streptomycin sulfate[19] has long been

considered an efficacious agent for the disease, but because of the problem of the route of administration, potential resistance and side effects, the oral agents are preferable. Penicillin is not effective and ampicillin[10,20] elicits variable and, at times, poor response. Because the drugs discussed above are contraindicated in pregnancy, erythromycin[21] is the current drug of choice, possibly with the addition of lincomycin.[22] No double-blind controlled studies testing the efficacy of treatment have been reported. Regardless of which agent is used, the usual week to ten-day course of antibiotics used in other types of bacterial infection does not seem long enough to eradicate granuloma inguinale, especially in its chronic form. Observation during treatment, extension of treatment until Donovan bodies are no longer identified on Giemsa touch preparations and a duration of treatment for at least three weeks give a high degree of success. Attempts at surgical excision should be avoided because the potential for spread of the infection exists and ultimate resolution with antibiotic treatment can be expected.

In the case of the patient we discuss, who was seen by eight physicians, only the last physician briefly entertained the diagnosis of granuloma inguinale and sent the patient immediately to a referral center for confirmation. There the diagnosis was made in short order with a touch preparation and the disease was treated effectively. Had treatment continued without diagnosis of this uncommon disorder, quite possibly the patient would have suffered extensive tissue destruction, requiring surgical reconstruction. The delay in diagnosis and successive unsuccessful courses of treatment over a prolonged period may be considered contributing factors leading to the request for psychotherapy regarding sexual dysfunction. Granuloma inguinale is a reportable disease of suspected venereal transmission; thus the case was reported to the public health department for follow-up.

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Postoperative Small Bowel Intussusception

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ALTHOUGH RARE in adults, postoperative small bowel intussusception can account for as high as 16% of cases of intussusception in children.[1] Frequently the diagnosis of postoperative intussusception is delayed because the clinical manifestations are masked by a recent abdominal procedure and an inappropriately low index of suspicion for this diagnosis.

We recently treated three patients with postoperative intussusception, which cases illustrate the problems in making the diagnosis and the usual clinical presentation following intra-abdominal operations in children.

Reports of Cases

Case 1

The patient, a 9½-month-old female infant, was admitted to a regional hospital with a three-week history of intermittent fever, vomiting and diarrhea and constipation during the previous few days. On admission the temperature was 37.5°C (99.5°F). The abdomen was distended with hypoactive bowel sounds. Abdominal rebound tenderness or muscular guarding was not present. The remainder of the physical examination showed no abnormalities. The serum chloride level was 111 and carbon dioxide level 20 mEq per liter; the rest of the electrolyte values, a complete blood count and analysis of urine were normal. Roentgenograms of the chest were normal, but abdominal films showed dilated loops of small and large intestine. The admitting diagnosis was large bowel obstruction and an exploratory celiotomy was done. Both small and large bowel were dilated, but a mechanical obstruction could not be found. An incidental appendectomy was done. The postoperative period was complicated by persistent ileus and wound dehiscence presumably due to infection. Following surgical treatment of the wound dehiscence, the temperature remained elevated to 38°C to 39°C (100°F to 102°F). On the fourth postoperative day bowel function returned and the nasogastric tube was removed. A regimen of metoclopramide hydrochloride was begun for treatment of persistent abdominal distension. On the fifth postoperative day a bloody stool was passed and she was referred to our institution for further management.

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